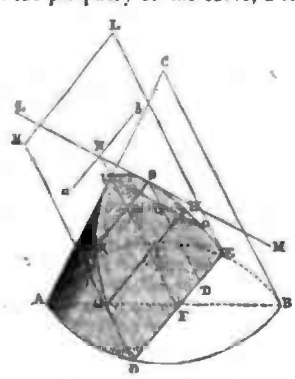
separately, and afterwards to consider them in reference to their related properties, and as being derivable from the projections and development of the mutual intersections of cones with cones, cylinders with cylinders, and cylinders with cones, so beautifully exemplified in the *Septenary Theory* of Mr. Jopling.

It is not, however, intended to discuss the whole of the properties peculiar to each of these curves, but only such as lead directly to some useful practical result, or the solution of some useful problem in the *constructive arts*, and in order that the subject may be rendered as plain and popular as possible, the several delineations will be illustrated by an example in numbers, and a rule drawn up in words by which it may be calculated. It will thus appear, that the system as at present contemplated, must be of considerable extent, but as all the results will tend to some useful purpose, it is hoped that the practical man will derive much advantage by a careful perusal of the papers as they severally appear, and for this end nothing is required, *à priori*, beyond a slight knowledge of the elements of Euclid and the rudiments of algebra. This being premised, we now proceed with the consideration of the parabola, that being the simplest in its principles and form of the three sections which constitute the system of conic geometry.

It has been stated above, that the section is a parabola when the cone is cut by a plane parallel to one of its sides; or, when the cutting plane and the side of the cone make equal angles with the base. To illustrate this, let A C B be a right cone of which C is the vertex, C A and C B opposite sides, and A B the diameter of its circular base A E B D; then if a plane D K L E be made to pass through the cone in a direction parallel to the side C B, the section D V E thereby produced is a parabola. The point V, where the cutting plane enters the side of the cone is the *vertex* of the parabola; the straight line D E, where the cutting plane intersects the base of the cone, is called the *base* of the parabola, and the straight line V F, which passes through the vertex V, and bisects the base in F, is called the *axis*. If through any point, I, in the axis V F a straight line, G H, be drawn, meeting the boundary of the section both ways in the points G and H, then G I is called an *ordinate*, and G H a *double ordinate*, to the axis V F; and V I the distance between the vertex at V and the ordinate, G H, is called an *abscissa*. If a third proportional be taken to the abscissa, V I, and ordinate G I, or to the abscissa V F, and ordinate D F, that third proportional is called the *parameter* of the axis V F; and if a point, P, be taken in the axis such that the ordinate P R, or P S, drawn through P, and parallel to the base D E, is equal to half the parameter of the axis, that point is called the *focus* or the *describing point*. If through the point S, or any other point in the periphery of the curve, a straight



line S T be drawn parallel to the axis V F, the line S T is called a *diameter*, in contradistinction to the principal diameter V F, which is always called the axis. If a straight line, L M, touch the curve in S, at the vertex of any diameter as S T, without cutting it, that line is called a *tangent* to the curve at the point S; and if through any point in the diameter S T, the straight line V O be drawn parallel to the tangent L M, and intersecting the diameter S T, in the point Q, the straight line V O, is a *double ordinate* to the diameter S T, and V Q, or O Q, an *ordinate*. If the axis F V be produced beyond the vertex, to meet the tangent L M, in the point N, P N, is called the *subtangent*; and if a perpendicular be drawn to the tangent L M, in the point of contact S, that line will also be perpendicular to the curve in the point S, and is called the *normal*. And finally, if V N be taken equal to V P, the distance between the focus P and the vertex V, and through N, a straight line, *a b*, be drawn parallel to the ordinate R S, the straight line, *a b*, is called the *directrix* of the curve, and serves for its description by means of points, or continued motion.

TUDOR IRONWORK.

FALL OF A ROOM AT THE PHILHARMONIC INSTITUTION, MANCHESTER.

Considerable alarm was created a few nights since at this institution during the performance. A loud crash was heard from behind the scenes and great shrieking, and noise of falling bodies. Immediately afterwards, Mr. Weston, the musical director of the institute, came forward, and explained that a plank or two had given way, and caused more alarm than danger. He subsequently stated that only one person was much hurt, but the nature of his injuries he had not learned. The *Manchester Guardian* says, "From an inspection of the place, we may state that the accident consisted in the giving way of the planks or rafters supporting a dressing-room, in which a great number of the male chorus were congregated taking refreshment. The weight being greater than the beams could support, they gave way, and fifty or sixty persons were at once precipitated to the stage, a fall of about 12 feet. It is really wonderful looking at the place, that an occurrence so alarming in appearance and in reality, should have been attended with so little serious injury. Only one person, so far as we could ascertain, was much hurt, and he was conveyed at once to the infirmary, to have his injuries examined.

TUDOR IRONWORK.

The annexed engravings form part of the illustration of Barrington Court, Somersetshire, given in our last number. The first represents the handle of the latch on the entrance door; the other, one of the turnbuckles on the iron casements. They are both drawn half the real size.

OPENING PUBLIC MONUMENTS.

The Dean of Winchester has given directions for the nave of the Cathedral to be thrown open to the public from nine till eleven in the morning, and from two to four in the afternoon. It is to be hoped no ill-conditioned verger, — no Winchester Tucker,—will be permitted to nullify this regulation.

We have observed with much pleasure that the Trustees of the Royal Institution, Edinburgh, have made arrangements by which a large, varied, and valuable collection of paintings, marbles, and bronzes are now thrown open twice a week for the gratuitous inspection of the public. This collection now contains the paintings bequeathed to the University by the late Sir James Erskine, of Torre, Bart., comprising specimens of the genius of the Carracci, Guido, Vandyke, Rembrandt, and other celebrated painters. The *Edinburgh Advertiser*, in making known this information, has the following remarks on the general question of gratuitous admission to works of art. "It is often said of this country that it provides little or no means of rational amusement and beneficial recreation for the working classes; that, in short, the principles of conservation and exclusion are too strictly applied to institutions which ought rightly to be open and accessible to all classes, and more particularly to that class which within themselves have little or no means of cultivating a taste for the sublime and beautiful, although it is admitted on all hands to be a most effectual

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